The new generator will help drive new research leading to improved understanding of how turbulence affects aircraft performance. It is part of an investment at ARA in new systems and services, funded by the Aerospace Technology Institute. The tool could help manufacturers to modify their aircraft designs or develop systems which compensate for gusts, leading to smoother flights.

“42 Technology has been instrumental in helping to develop ARA’s new gust generator and to meet the demanding delivery deadlines for this large-scale project. Their engineers worked very well alongside our in-house team to develop and integrate the control system and to help us launch a world first for aerospace research.”

— Kevin Williams, chief engineer at ARA.
“The anxiety was building. She tentatively removed it from the fridge and set it down. After a couple of minutes, Lucy opened the box and allowed a fresh injector pen to slide out. The severe asthma had knocked her confidence for two years. She was fed up.”

“She plunged the needle in to the pinch of fat on her abdomen. The sharp pain was over in a matter of seconds. After the audible click, Lucy cautiously removed the product she loved yet hated, and placed it carefully inside the sharps bin. It was over. “Until tomorrow”, she sighed.”

What was that? It’s a story about a woman who relies on using an injector pen to treat her severe asthma. In reality, this story was used as a prototype and was shared with many patients. It served as a powerful tool for making design decisions.

Why make a prototype? Simple: prototypes communicate ideas, allow new learning and better decision-making. Physical prototypes tend to lack emotion, focus on functionality and are confined to the location they inhabit. Frequently you will require a physical prototype to answer “What?” and “How?”, but rarely will it answer “Why?”.

Stories can be prototypes too Whether you’re designing a medical device, an app, a complex mechanism, a piece of consumer packaging or an industrial system, a story is one of the most critical product design tools. However, only a small number of designers take advantage of its potential.

Story-centered design For years, designers have preached human-centered design, and quite rightly so, but the world has moved on. People now expect delightful experiences that exceed their expectations. Achieving this whilst integrating innovative technology demands a new skill set. Human-centered designers must become story-centered designers.
Why bother?
Embracing stories as part of your prototyping toolkit will help identify user goals, engage users on an emotional level and reach the far corners of the earth. Here’s why...

1. GOALS
In order to identify value for a user, a story-centered designer must identify the goals of a user. What are they trying to achieve? By generating a prototype in the form of a story - let’s call this a “story prototype” - any given goal can be validated as real or perceived.

The inclusion of a time element allows interrogation throughout a fictional experience. Users are able to provide real-time feedback on what they can relate to and what they deem superficial. This process delivers clarity for identifying users’ underlying goals.

Lucy’s story: The team received feedback related to human factors. Users disputed the injector pen “sliding” out. They preferred to use their forefinger and thumb. This facilitated a quick design decision regarding the packaging lid. The story was subsequently adopted where Lucy “picks out” the injector pen. This was tested with more users for further feedback.

2. ENGAGEMENT
When we are exposed to facts, there are two parts of our brain responsible for turning words into meaning. But when we are exposed to a fiction, our brain engages on a deeper level.

If a story describes smell, the brain’s olfactory cortex is engaged. If a story contains movement, the motor cortex is activated. This is why when we are reading a book, it feels like we’re really in it. This is the impact of our brain responding to the emotive language used in fictional stories.

This deeper level of engagement allows users to respond to story prototypes by expressing visceral reactions. These reactions provide much richer learning. Story-centered designers must generate the conditions for these reactions to occur and then capture them in order to make insightful decisions.

Lucy’s story: Many of the users responded with flamboyant empathy for Lucy. They identified with her “knocked confidence” and feeling “fed up”. Their reactions gave the design team confidence that they profoundly understood the underlying user emotions, enabling an effective marketing campaign.

3. REACH
A story prototype could also be a talk, a video, an animation, a storyboard or even role play. But crucially, a story prototype is geographically and culturally unbound. With the rise of digital media and email, a story-centered designer could, for example, expose 10 users in 10 countries to 10 stories in 10 minutes. Broader, faster and more diverse learning is enabled.

Lucy’s story: It was critical to meet a diverse range of user needs. Multiple iterations of this story were shared with users all around the world. Story prototypes were sent out as digital storyboards and feedback was collected through Skype. There was no need to invest in expensive physical prototypes in order to uncover these far-reaching needs.

What’s your story?
What prototype have you got lying around the office? Can you honestly say that it identifies user goals, engages users on an emotional level and reaches the far corners of the earth? Why not try transforming it into a story? You’ll be amazed at what happens!
Inspiring at Maker Faires since 2010

42 Technology’s Simon Jelley and Associate Mark Mellors have been exhibiting at Maker Faires since 2010 and share some of their creations for inspiring the next generation of engineers.

“We built a Kelvin’s Thunderstorm where trickling water through a special non-moving arrangement creates high electrostatic voltages (~50,000V). The electrostatic attraction was sufficient that the droplets would ignore gravity and orbit the charged rings!

For an interactive exhibit, we used a Microsoft Kinect to control a giant toy crane using only body gestures. It was amazing to see how quickly people got the hang of moving things by waving their arms around!

Most popular with the kids was when we used some ceiling-light diffusers and a broken pedestal fan from next door’s skip to make a fully functioning wind tunnel based on NASA designs. Kids made their own paper planes and used the tunnel to analyse and improve their designs.

We’ve got some ideas for next year’s shows. As well as a maglev hoverboard, we’ve been working on a wearable belt with electric jet engines that will make skateboarding to work a little less arduous.”

For pictures and videos of Simon and Mark’s projects, visit: www.jellyandmarshmallows.co.uk

42 Technology expands its team and facilities following record growth in 2015

We have achieved a significant increase in our capacity to handle client projects following record business growth in 2015.

Our staff numbers have increased by 40% over the last year, we have added more offices, and have just doubled the size of our development laboratories. This allows us to accommodate even more experimental and technology development work, as well as being able to build larger-scale test or prototype manufacturing systems.

We have grown hugely in 2015 with annual sales up over 55% compared with 2014, the number of active client projects has never been higher, and we have added 12 new team members with specialist skills in areas such as software development, analytical modelling and international project management.

2016 is also off to a flying start with a strong pipeline of work, and we are actively recruiting to fill a number of additional positions over the next few months.

Our expanded laboratory space will also be used to build and house a working prototype of our adaptable train carriage concept which was announced last year as a winner in the ‘Tomorrow’s Train Design Today’ competition. The demonstrator system is due to be unveiled later this year.